CONFIDENTIAL

HRS PRELIMINARY SCORE

for the

Cement Creek

Upper Animas Mining District Site

Silverton, San Juan County, Colorado

Cement Creek has been evaluated using the Hazard Ranking System scoring strategy, and is based on data collected during the preparation of a Data Gap Analysis Report for the EPA. Two scenarios were tested; an available data scenario, using available data, and a worst case scenario using worst case hypothetical data that could be collected in a future investigation.

Sources

At least 33 historic individual sources have been documented in the Cement Creek drainage. Cement Creek was evaluated in both scenarios based on the existence of twenty-eight unremediated sources of mine and mill waste totaling approximately 145,690 cubic yards. Some sources are located partially or completely in the surface water. Thirteen of these sources were sampled in the summer of 1996. Arsenic, cadmium, copper, lead, manganese, and zinc are the metals of concern. Exact locations of samples and documentation of data validation are not available.

Groundwater Pathway

There are seven domestic and household use wells located in the Cement Creek drainage. It is not documented that these wells are actually used as such. The average number of residents per household in San Juan County is 2.06 which results in 14 potential human targets. There are no municipal groundwater wells within four miles of Cement Creek. Neither scenario addresses contaminated groundwater.

Surface Water Pathway

There are no surface water intakes for drinking water, agricultural, or industrial/commercial use within the 15-mile downstream limit on the Animas River. Silverton's drinking water is obtained from drainages not affected by Cement Creek.

The Animas River is used for recreational boating from above Silverton to Durango---covering the entire 15-mile downstream limit.

There are 2,500 feet of streamside wetlands along Cement Creek. There are no documented sediment samples from these wetlands. There is no aquatic life in Cement

Creek.

There are approximately 3 miles of streamside wetlands along the 15-mile downstream segment of the Animas River from the confluence with Cement Creek (PPE) in Silverton. The Animas River is stocked and fished below Silverton within the 15-mile downstream limit and the fish are consumed.

There are no samples available of contaminated wetlands or contaminated fish tissue from the Animas River below the confluence of Cement Creek.

For the second scenario it is assumed that 1 mile of wetlands is contaminated and that one pound of fish caught in the Animas River is eaten.

Soil Exposure and Air Pathway

Several residences are along the Cement Creek road and abandoned mine sites, waste rock piles, and tailings in the Cement Creek drainage are used by recreational ATV riders. Workers at the Silverton Mountain Ski Area perform maintenance operations during the summer months.

For the "Worst Case" scenario it is assumed that one residence is constructed within 200 feet of a source of contamination (mine waste dump).

1st Scenario

The Quickscore generated for the site from Current Data is:

Groundwater Pathway:	0.00
Surface Water Pathway	91.34
Soil Exposure	3.33
Air Pathway	0.00
Site Score:	**45.70**

2nd Scenario

The Quickscore generated for the "Worst Case" uses Level I contamination of 1 mile of wetlands and 1 pound of fish eaten; and soil contamination within 200 feet of a single residence:

Groundwater Pathway:	0.00
Surface Water Pathway	100.00

Soil Exposure Pathway	56.67
Air Pathway	0.00
Site Score:	**57.47**

****** CONFIDENTIAL ******
******PRE-DECISIONAL DOCUMENT ******
****** SUMMARY SCORESHEET ******
****** FOR COMPUTING PROJECTED HRS SCORE ******

****** Do Not Cite or Quote ******

Site Name: Upper Animas Mining District Region: 8

City, County, State: San Juan Co., Colorado Evaluator: B Hayhurst

EPA ID#: CO0001411347 Date: 10/14/09

Lat/Long: T/R/S:

Congressional District:

This Scoresheet is for: SI

Scenario Name: current data

Description: Current data from historical sampling. Data quality unconfirmed, source sizes unconfirmed.

	S pathway	S^2 pathway
Ground Water Migration Pathway Score (S_{gw})	0	0
Surface Water Migration Pathway Score (S_{sw})	91.34	8342.9956
Soil Exposure Pathway Score (S_s)	3.33	11.0889
Air Migration Score (S_a)	0	0
$S^2_{gw} + S^2_{sw} + S^2_s + S^2_a$		8354.0845
$(S^2_{gw} + S^2_{sw} + S^2_s + S^2_a)/4$		2088.521125
$/ (S^2_{gw} + S^2_{sw} + S^2_s + S^2_a)/4$		45.7

υ Pathways not assigned a score (explain):

TABLE 3-1 --GROUND WATER MIGRATION PATHWAY SCORESHEET

Factor categories and factors	Maximum Value	Value Assigned
Aquifer Evaluated:		
Likelihood of Release to an Aquifer:		
1. Observed Release	550	0
2. Potential to Release:		
2a. Containment	10	
2b. Net Precipitation	10	
2c. Depth to Aquifer	5	
2d. Travel Time	35	
2e. Potential to Release [lines 2a(2b + 2c + 2d)]	500	
3. Likelihood of Release (higher of lines 1 and 2e)	550	0
Waste Characteristics:		
4. Toxicity/Mobility	(a)	
5. Hazardous Waste Quantity	(a)	
6. Waste Characteristics	100	
Targets:		
7. Nearest Well	(b)	
8. Population:		
8a. Level I Concentrations	(b)	
8b. Level II Concentrations	(b)	
8c. Potential Contamination	(b)	
8d. Population (lines 8a + 8b + 8c)	(b)	
9. Resources	5	
10. Wellhead Protection Area	20	
11. Targets (lines 7 + 8d + 9 + 10)	(b)	
Ground Water Migration Score for an Aquifer:		
12. Aquifer Score [(lines 3 x 6 x 11)/82,5000][c]	100	0
Ground Water Migration Pathway Score:		
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated)[c]	100	0

[a] Maximum value applies to waste characteristics category
[b] Maximum value not applicable
[c] Do not round to nearest integer

TABLE 4-1 --SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor categories and factors	Maximum Value	Value Assigned	
Watershed Evaluated:			
Drinking Water Threat			
Likelihood of Release:			
1. Observed Release	550	550	
2. Potential to Release by Overland Flow:			
2a. Containment	10		
2b. Runoff	10		
2c. Distance to Surface Water	5		
2d. Potential to Release by Overland Flow [lines 2a(2b + 2c)]	35		
3.Potential to Release by Flood:			
3a. Containment (Flood)	10		
3b. Flood Frequency	50		
3c. Potential to Release by Flood (lines 3a x 3b)	500		
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500		
5. Likelihood of Release (higher of lines 1 and 4)	550		550
Waste Characteristics:			
6. Toxicity/Persistence	(a)		
7. Hazardous Waste Quantity	(a)	10000	
8. Waste Characteristics	100		0
Targets:			
9. Nearest Intake	50		
10. Population:			
10a. Level I Concentrations	(b)		
10b. Level II Concentrations	(b)		
10c. Potential Contamination	(b)		
10d. Population (lines 10a + 10b + 10c)	(b)		
11. Resources	5		
12. Targets (lines 9 + 10d + 11)	(b)		
Drinking Water Threat Score:			
13. Drinking Water Threat Score [(lines 5x8x12)/82,500, subject to a max of 100]	100		0
Human Food Chain Threat			
Likelihood of Release:			
14. Likelihood of Release (same value as line 5)	550		550
Waste Characteristics:			
15. Toxicity/Persistence/Bioaccumulation	(a)	50000000	
16. Hazardous Waste Quantity	(a)	10000	
17. Waste Characteristics	1000		560
Targets:			
18. Food Chain Individual	50	20	
19. Population			
19a. Level I Concentration	(b)		
19b. Level II Concentration	(b)		
19c. Potential Human Food Chain Contamination	(b)	0.03003	
19d. Population (lines 19a + 19b + 19c)	(b)	0.03	
20. Targets (lines 18 + 19d)	(b)		20
Human Food Chain Threat Score:			
21. Human Food Chain Threat Score [(lines 14x17x20)/82500, subject to max of 100]	100		74.67
Environmental Threat			
Likelihood of Release:			
22. Likelihood of Release (same value as line 5)	550		550
Waste Characteristics:			
23. Ecosystem Toxicity/Persistence/Bioaccumulation	(a)	500000000	
24. Hazardous Waste Quantity	(a)	10000	
25. Waste Characteristics	1000		1000

Targets:			
26. Sensitive Environments			
26a. Level I Concentrations	(b)		
26b. Level II Concentrations	(b)		
26c. Potential Contamination	(b)	2.5	
26d. Sensitive Environments (lines 26a + 26b + 26c)	(b)	2.5	
27. Targets (value from line 26d)	(b)		2.5
Environmental Threat Score:			
28. Environmental Threat Score [(lines 22x25x27)/82,500 subject to a max of 60]	60		16.67
Surface Water Overland/Flood Migration Component Score for a Watershed			
29. Watershed Score[c] (lines 13+21+28, subject to a max of 100}	100		91.34
Surface Water Overland/Flood Migration Component Score			
30. Component Score (S_{sw})[c] (highest score from line 29 for all watersheds evaluated)	100		91.34

[a] Maximum value applies to waste characteristics category
[b] Maximum value not applicable
[c] Do not round to nearest integer

TABLE 5-1 –SOIL EXPOSURE PATHWAY SCORESHEET

Factor categories and factors	Maximum Value	Value Assigned	
Likelihood of Exposure:			
1. Likelihood of Exposure	550		550
Waste Characteristics:			
2. Toxicity	(a)	10000	
3. Hazardous Waste Quantity	(a)	10000	
4. Waste Characteristics	100		100
Targets:			
5. Resident Individual	50	0	
6. Resident Population:			
6a. Level I Concentrations	(b)		
6b. Level II Concentrations	(b)		
6c. Population (lines 6a + 6b)	(b)		
7. Workers	15	5	
8. Resources	5		
9. Terrestrial Sensitive Environments	(c)		
10. Targets (lines 5 + 6c + 7 + 8 + 9)	(b)		5
Resident Population Threat Score			
11. Resident Population Threat Score (lines 1 x 4 x 10)	(b)		275000
Nearby Population Threat			
Likelihood of Exposure:			
12. Attractiveness/Accessibility	100	50	
13. Area of Contamination	100	5	
14. Likelihood of Exposure	500		5
Waste Characteristics:			
15. Toxicity	(a)	10000	
16. Hazardous Waste Quantity	(a)	10000	
17. Waste Characteristics	100		100
Targets:			
18. Nearby Individual	1	0	
19. Population Within 1 Mile	(b)	0.1	
20. Targets (lines 18 + 19)	(b)		0.1
Nearby Population Threat Score			
21. Nearby Population Threat (lines 14 x 17 x 20)	(b)		50
Soil Exposure Pathway Score:			
22. Pathway Score[d] (S_s), [lines (11+21)/82,500, subject to max of 100]	100		3.33

[a] Maximum value applies to waste characteristics category
[b] Maximum value not applicable
[c] No specific maximum value applies to factor. However, pathway score based solely on terrestrial sensitive environments is limited to a maximum of 60
[d] Do not round to nearest integer

****** CONFIDENTIAL ******
******PRE-DECISIONAL DOCUMENT ******
****** SUMMARY SCORESHEET ******
****** FOR COMPUTING PROJECTED HRS SCORE ******

****** Do Not Cite or Quote ******

Site Name: Upper Animas Mining District — Region: 8

City, County, State: San Juan Co., CO — Evaluator: B. Hayhurst

EPA ID#: CO0001411347 — Date: 10/14/2009

Lat/Long: — T/R/S:

Congressional District:

This Scoresheet is for: SI

Scenario Name: worst case scenario

Description: current data

	S pathway	S^2 pathway
Ground Water Migration Pathway Score (S_{gw})	0	0
Surface Water Migration Pathway Score (S_{sw})	100	10000
Soil Exposure Pathway Score (S_s)	56.67	3211.4889
Air Migration Score (S_a)	0	0
$S^2_{gw} + S^2_{sw} + S^2_s + S^2_a$		13211.4889
$(S^2_{gw} + S^2_{sw} + S^2_s + S^2_a)/4$		3302.872225
$/ (S^2_{gw} + S^2_{sw} + S^2_s + S^2_a)/4$		57.47

υ Pathways not assigned a score (explain):

TABLE 4-1 –SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor categories and factors	Maximum Value	Value Assigned	
Watershed Evaluated:			
Drinking Water Threat			
Likelihood of Release:			
1. Observed Release	550	550	
2. Potential to Release by Overland Flow:			
2a. Containment	10		
2b. Runoff	10		
2c. Distance to Surface Water	5		
2d. Potential to Release by Overland Flow [lines 2a(2b + 2c)]	35		
3.Potential to Release by Flood:			
3a. Containment (Flood)	10		
3b. Flood Frequency	50		
3c. Potential to Release by Flood (lines 3a x 3b)	500		
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500		
5. Likelihood of Release (higher of lines 1 and 4)	550		550
Waste Characteristics:			
6. Toxicity/Persistence	(a)		
7. Hazardous Waste Quantity	(a)	10000	
8. Waste Characteristics	100		0
Targets:			
9. Nearest Intake	50		
10. Population:			
10a. Level I Concentrations	(b)		
10b. Level II Concentrations	(b)		
10c. Potential Contamination	(b)		
10d. Population (lines 10a + 10b + 10c)	(b)		
11. Resources	5		
12. Targets (lines 9 + 10d + 11)	(b)		
Drinking Water Threat Score:			
13. Drinking Water Threat Score [(lines 5x8x12)/82,500, subject to a max of 100]	100		0
Human Food Chain Threat			
Likelihood of Release:			
14. Likelihood of Release (same value as line 5)	550		550
Waste Characteristics:			
15. Toxicity/Persistence/Bioaccumulation	(a)	50000000	
16. Hazardous Waste Quantity	(a)	10000	
17. Waste Characteristics	1000		560
Targets:			
18. Food Chain Individual	50	45	
19. Population			
19a. Level I Concentration	(b)		
19b. Level II Concentration	(b)		
19c. Potential Human Food Chain Contamination	(b)	0.03003	
19d. Population (lines 19a + 19b + 19c)	(b)	0.03	
20. Targets (lines 18 + 19d)	(b)		45
Human Food Chain Threat Score:			
21. Human Food Chain Threat Score [(lines 14x17x20)/82500, subject to max of 100]	100		100
Environmental Threat			
Likelihood of Release:			
22. Likelihood of Release (same value as line 5)	550		550
Waste Characteristics:			
23. Ecosystem Toxicity/Persistence/Bioaccumulation	(a)	500000000	
24. Hazardous Waste Quantity	(a)	10000	
25. Waste Characteristics	1000		1000

Targets:			
26. Sensitive Environments			
26a. Level I Concentrations	(b)		
26b. Level II Concentrations	(b)	25	
26c. Potential Contamination	(b)		
26d. Sensitive Environments (lines 26a + 26b + 26c)	(b)	25	
27. Targets (value from line 26d)	(b)		25
Environmental Threat Score:			
28. Environmental Threat Score [(lines 22x25x27)/82,500 subject to a max of 60]	60		60
Surface Water Overland/Flood Migration Component Score for a Watershed			
29. Watershed Score[c] (lines 13+21+28, subject to a max of 100)	100		100
Surface Water Overland/Flood Migration Component Score			
30. Component Score (S_{sw})[c] (highest score from line 29 for all watersheds evaluated)	100		100

[a] Maximum value applies to waste characteristics category
[b] Maximum value not applicable
[c] Do not round to nearest integer

TABLE 5-1 --SOIL EXPOSURE PATHWAY SCORESHEET

Factor categories and factors	Maximum Value	Value Assigned	
Likelihood of Exposure:			
1. Likelihood of Exposure	550		550
Waste Characteristics:			
2. Toxicity	(a)	10000	
3. Hazardous Waste Quantity	(a)	10000	
4. Waste Characteristics	100		100
Targets:			
5. Resident Individual	50	50	
6. Resident Population:			
6a. Level I Concentrations	(b)	30	
6b. Level II Concentrations	(b)	0	
6c. Population (lines 6a + 6b)	(b)	30	
7. Workers	15	5	
8. Resources	5		
9. Terrestrial Sensitive Environments	(c)		
10. Targets (lines 5 + 6c + 7 + 8 + 9)	(b)		85
Resident Population Threat Score			
11. Resident Population Threat Score (lines 1 x 4 x 10)	(b)		4675000
Nearby Population Threat			
Likelihood of Exposure:			
12. Attractiveness/Accessibility	100	50	
13. Area of Contamination	100	5	
14. Likelihood of Exposure	500		
Waste Characteristics:			
15. Toxicity	(a)	10000	
16. Hazardous Waste Quantity	(a)	10000	
17. Waste Characteristics	100		0
Targets:			
18. Nearby Individual	1	0	
19. Population Within 1 Mile	(b)	0.1	
20. Targets (lines 18 + 19)	(b)		
Nearby Population Threat Score			
21. Nearby Population Threat (lines 14 x 17 x 20)	(b)		0
Soil Exposure Pathway Score:			
22. Pathway Score[d] (S_s), [lines (11+21)/82,500, subject to max of 100]	100		56.67

[a] Maximum value applies to waste characteristics category
[b] Maximum value not applicable
[c] No specific maximum value applies to factor. However, pathway score based solely on terrestrial sensitive environments is limited to a maximum of 60
[d] Do not round to nearest integer